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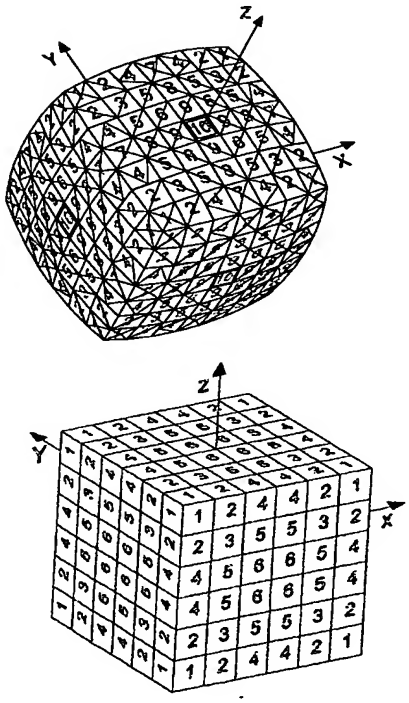
(54) Title: CUBIC LOGIC TOY



(57) **Abstract:** This is an invention that concerns the construction of three-dimensional logic toys, which have the shape of a normal solid, substantially cubic in shape, and N number of layers in each direction of the three-dimensional rectangular Cartesian coordinate system, said layers consisting of smaller separate pieces. Their sides that form part of the solid's external surface are substantially cubic. The said pieces can rotate in layers around the three-dimensional axes of the coordinates; their visible rectangular surfaces can be colored or they can bare shapes, letters or numbers. The construction is based on the configuration of the internal surfaces of the separate pieces using planar, spherical and mainly right conical surfaces, coaxial to the semi-axis of the coordinates, the number of which is $\underline{\kappa}$ per semi-axis. The advantage of this construction is that by the use of these κ conical surfaces per semi-axis, two solids arise each time; the first has an even ($N=2\kappa$) number of layers per direction visible to the user, whereas the second has the next odd ($N=2\kappa+1$) number of visible layers per direction. As a result, by using a unified method and way of construction, for the values of κ from 1 to 5, we can produce in total eleven logic toys whose shape is a normal geometric solid, substantially cubic in shape. These solids are the Cubic Logic Toys No N, where N can take values from N=2 to N=11. The invention became possible after we have solved the problem of connecting the corner piece with the interior of the cube, so that it can be self - contained, can rotate unobstructed around the axes of the three-dimensional rectangular Cartesian coordinate system and, at the same time, can be protected from being dismantled. This invention is unified and its advantage is that, with a new different internal configuration, we can construct - apart from the already known cubes 2x2x2, 3x3x3, 4x4x4, 5x5x5 which have already been constructed in many different ways and by different people - the next cubes from N=6 up to N=11. Finally, the most important advantage is that it eliminates the operational disadvantages that the already existing cubes have, except for the Rubik cube, i.e. 3x3x3.

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